CLAIMS

WE CLAIM:

1. A method for characterizing a digital optical receiver, comprising:

creating an output pulse waveform by convolving a receiver impulse response and an input pulse; and

generating an eye diagram by repeatedly overlaying the output pulse waveform every bit period.

2. The method of Claim 1, further comprising: prior to the creating step, obtaining a bit stream for transmission, thereby generating an input sequence.

3. The method of Claim 2, further comprising: prior to the obtaining step, estimating a transmitted pulse input waveform for a receiver, thereby generating pulses used to obtain the bit stream.

4. The method of Claim 3, further comprising: prior to the estimating step, measuring the receiver impulse response from the receiver.

5. The method of Claim 2, wherein the bit stream is obtained as follows:

$$\Sigma_n a_n * P(t-n*T)$$

where P is a pulse shape, T is a pre-determined bit period, and a_n is the input sequence.

6. The method of Claim 1, wherein the output pulse waveform is obtained as

follows:

$$\sum_{n} a_n * X\,(t - n*T + d)$$

where T is a pre-determined bit period, a_n is an input sequence, d is the delay in the receiver, and X() is a function for creating a pulse stream.

7. The method of Claim 1, further comprising: after the generating step, estimating a worst case bit rate error (BER) and an amount of noise present in the receiver from an amount of eye closure in the eye diagram.

8. A computer-implemented method, comprising:

(a) creating a first output pulse waveform by convolving a first receiver impulse response and a first input pulse;

(b) generating an eye diagram from the first output pulse waveform at a first bit period;

(c) creating a second output pulse waveform by convolving a second receiver impulse response and a second input pulse; and

(d) generating the eye diagram by overlaying the first output pulse waveform with the second pulse waveform at a second bit period.

9. The method of Claim 10, further comprising: repeating steps (c) and (d) for a subsequent bit period.